AMENDMENTS TO THE SPECIFICATION

Page 1, after the TITLE, please insert the following:

-- RELATED APPLICATIONS

This application is a § 371 from PCT/US2005/007585 filed March 7, 2005, which claims priority benefit of provisional patent application Serial No. 60/550,614 filed March 6, 2004, which is incorporated by reference in its entirety and is a continuation-in-part of application Serial No. 10/832,684 filed April 26, 2004, each of which is incorporated by reference in its entirety. --

Please amend paragraphs [0010] and [0012] as follows:

[0010]In filter scanned imagers, an ordinary broadband camera images a scene of interest, but a tunable filter is inserted somewhere in the optical path between the scene and the camera. The filter may be a liquid crystal tunable filter such as a CRI VariSpec LCTF (see. http://www.cri-nc.com/files/VariSpec_Brochure.pdf), or any similar device that transmits a narrowband of wavelengths at any given time, with the center wavelength of the band tunable in time. FIG. 31 ~~61~~ depicts a typical liquid crystal tunable filter scanned spectral imaging system 3000. Light from the object 3010 enters the collimating lens system 3020 where it encounters the liquid crystal tunable filter system

3030 and then propagates onto the focusing lens system 3040 where the object is focused onto the focal plane 3050.

[0012] Multiplexed focal plane array spectral imaging systems, such as Fourier transform interferometric imaging systems, typically employ an imaging optical system, the output of which is passed through an interferometric assembly, and then imaged onto a focal plane array. As the interferometer is scanned, a multiplexed spectral image is acquired. FIG. 32 ~~62~~ depicts a conventional scanning multiplexed focal plane array spectral imaging system, such as a Fourier transform focal plane array spectral imaging system 4000. The object source 4010 is collected by image grade collimating optics 4020 where it is collimated onto a beam splitter 4030 that splits the energy 50/50 to stationary mirror 4040 and to a moving mirror 4050. This is then recombined at the beamsplitter 4030 and propagates onto the focusing optics 4060 and is re-imaged onto the focal plane 4070.

Please amend paragraphs [0057], [0058], [0066], [0078], and [0079] as follows:

[0057] FIG. 31 illustrates ~~hyper-spectral imaging from airborne camera~~ a conventional liquid crystal tunable filter scanned spectral imaging system;

[0058] FIG. 32 ~~is an illustration of a hyper-spectral image of human skin~~ illustrates a conventional scanning

multiplexed spectral imaging system, such as a Fourier transform focal plane array spectral imaging system;

[0066] ~~FIG. 41 illustrates~~ FIGs. 41-1 and 41-2 illustrate the top 10 wavelet packets in local regression basis selected using 50 training samples in the example of FIG. 40; FIG 42 is a scatter plot of protein content (test data) vs. correlation with top wavelet packet; Fig 43 illustrates PLS regression of protein content of test data;

[0078] FIG. 59 is an example of the mapping of micro-mirror columns to the dispersed spectral images at the focal plane of a 2D array sensor, FPA or camera in accordance with an embodiment of the present invention; and

[0079] FIG. 60 illustrates a conventional pushbroom spectral imaging spectral system. [[;]]

Please delete paragraphs [0080] and [0081].

Please amend paragraphs [00170] and [00211] as follows,

[00170] In accordance with the present invention, significant improvement over the prior art can be achieved using hyper-spectral processing that focuses of predefined characteristics of the data. For example, in many cases only a few particular spectral lines or bands out of the whole data space are required to discriminate one substance over another. It is also often the case that target samples do not possess

very strong or sharp spectral lines, so it can not be necessary to use strong or sharp bands in the detection process. A selection of relatively broad bands can be sufficient to discriminate between the target object and the background. It should be apparent that the ease with which different spatio-spectral bands can be selected and processed in accordance with the present invention is ideally suited for such hyperspectrum applications. A generalized block diagram of hyper-spectral processing in accordance with the invention is shown in Fig. 29. Fig. 30 illustrates two spectral components (red and green) of a data cube produced by imaging the same object in different spectral bands. It is quite clear that different images contain completely different kinds of information about the object. ~~The same idea is illustrated in Figs. 31 and 32, where Fig. 31 illustrates hyper-spectral imaging from airborne camera and shows how one can identify different crops in a scene, based on the predominant spectral characteristic of the crop. Fig. 32 is an illustration of a hyper-spectral image of human skin with spectrum progressing from left to right and top to bottom, with increasing wavelength.~~

[00211] ~~Fig. 41 illustrates~~ <u>Figs. 41-1 and 41-2 illustrate</u> the top 10 wavelet packets in local regression basis selected using 50 training samples. Each Walsh packet provides a measurement useful for estimation. For example, the top line indicates that by combining the two narrow bands

at the ends and then subtracting the middle band we get a quantity which is linearly related to the protein concentration. Fig. 42 is a scatter plot of protein content (test data) vs. correlation with top wavelet packet. This illustrates a simple mechanism to directly measure relative concentration of desired ingredients of a mixture.